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Jameco Part Number 220231 (NFS110-7604P)

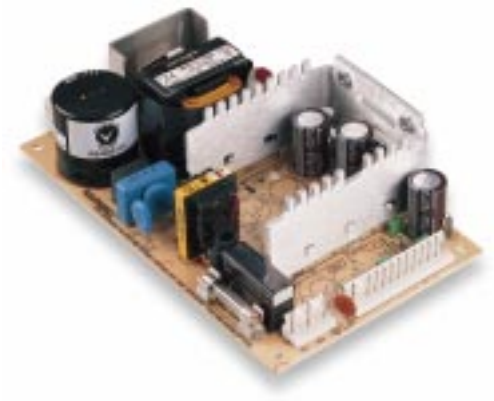
NFS110 Series

Single and quad output

ARTESYN TECHNOLOGIES

LOW TO MEDIUM POWER AC/DC POWER SUPPLIES | 80-110W AC/DC Universal Input Switch Mode Power Supplies | 1

- **7.0 x 4.25 x 1.8 inch package**
- **Overvoltage and short circuit protection**
- **110W with 20CFM**
- **Adjustable outputs**
- **EN55022, EN55011 conducted emissions level B**
- **UL, VDE and CSA safety approvals**
- **CE mark**



The NFS110 series is a 110W universal input AC/DC power supply on a 7 x 4.25 inch card. The NFS110 series has four single and three quad output models and has proven itself to be highly reliable and versatile product for a wide range of communication and industrial applications, with a very high peak current capability on each output for drive and motor applications. The NFS110 provides 80W of output power with free air convection cooling which can be boosted to 110W with 20CFM of air. Standard features include overvoltage and short circuit protection. The series, with full international safety approval and the CE mark, meets conducted emissions EN55022 level B. The NFS110 series is designed for use in low power data networking, computer, telecom and industrial applications such as servers, thermal printers, storage devices, vending machines and POS equipment.

CE (LVD)

2 YEAR WARRANTY

All specifications are typical at nominal input, full load at 25°C unless otherwise stated

SPECIFICATIONS

OUTPUT SPECIFICATIONS

Voltage adjustability	+5.1V output on multi's 5.1V single output 12V single output 15V single output 24V single output	±3.0% ±3.0% 12V to 14V 15V to 18V 24V to 30V
Line regulation	LL to HL, FL All outputs on all units	±0.1% max.
Overshoot/undershoot	At turn-on	0%
Temperature coefficient	All outputs	±0.02%/°C
Overvoltage protection	Multi output 5.1V only 5.1V single 12V single 15V single 24V single	6.25V±0.75V 6.25V±0.75V 15.75V±1.0V 22V±1.5V 33V±2.5V
Output power limit	Primary power limited	Pin max. 160W Pout min. 110W
Minimum output current	(See Note 13)	0A
Short circuit protection		Burst mode operation

INPUT SPECIFICATIONS

Input voltage range		85 to 264VAC 120 to 370VDC
Input frequency range		47Hz to 440Hz
Input surge current	230VAC	35A
Safety ground leakage current	110VAC, 50Hz 230VAC, 50Hz	0.2mA, max. 0.4mA, max.

EMC CHARACTERISTICS

Conducted emissions	EN55022, FCC part 15	Level B
Radiated emissions	EN55022, FCC part 15	Level A
ESD air	EN61000-4-2, level 3	Perf. criteria 1
ESD contact	EN61000-4-2, level 4	Perf. criteria 1
Surge	EN61000-4-5, level 3	Perf. criteria 1
Fast transients	EN61000-4-4, level 3	Perf. criteria 1
Radiated immunity	EN61000-4-3, level 3	Perf. criteria 2
Conducted immunity	EN61000-4-6, level 3	Perf. criteria 1

GENERAL SPECIFICATIONS

Hold-up time	110VAC @ 80W 110VAC @ 110W 230VAC @ 80W 230VAC @ 110W	35ms 17ms 140ms 100ms
Efficiency	Multiple outputs +5.1V single 12V and 15V singles 24V single	70% typical 70% typical 72% typical 75% typical
Isolation voltage	Input/output Input/chassis	3000VAC 1500VAC
Switching frequency	At 100 Watts output At zero load	20 to 70kHz 100 to 250kHz
Approvals and standards (See Note 12)		VDE0805, EN60950, IEC950 IEC1010, UL1950 CSA C22.2 No. 950
Weight	Singles Multiple outputs	550g (19.4oz) 600g (21.2oz)
MTBF (See Note 9)	MIL-HDBK-217E	125,000 hours

ENVIRONMENTAL SPECIFICATIONS

Thermal performance (See Notes 9, 10)	Operating, see curve Non-operating 0°C to +50°C, amb. convection cooled +50°C to +70°C, amb. convection cooled 0°C to +50°C, 20CFM forced air +50°C to +70°C, 20CFM forced air Peak, 0°C to +50°C, max. 60 seconds	0°C to +70°C –40°C to +85°C 80W Derate 2W/°C 110W Derate 2.75W/°C 110W
Relative humidity	Non-condensing	5% to 95% RH
Altitude	Operating Non-operating	10,000 feet max. 40,000 feet max.
Vibration (See Note 11)	5Hz to 500Hz	2.4G approx.

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For the most current data and application support visit www.artesyn.com/powergroup/products.htm

OUTPUT VOLTAGE	OUTPUT CURRENTS			RIPPLE (4)	TOTAL REGULATION (5)	MODEL NUMBERS (F)
	MAX (1)	PEAK (2)	FAN (3)			
+5.1V	8.0A	20.0A	10.0A	50mV	±2.0%	NFS110-7601P
+12.0V	4.5A	9.0A	5.0A	120mV	±3.0%	
–12.0V	0.5A	1.5A	1.0A	120mV	±3.0%	
–5.0V	0.5A	1.5A	1.0A	50mV	±3.0%	
+5.1V (I_A)	8.0A	20.0A	10.0A	50mV	±2.0%	NFS110-7602P (6)
+24.0V (I_B) (6)	3.5A	4.5A	4.5A	240mV	+10/–5.0%	
+12.0V	4.5A	9.0A	5.0A	120mV	±3.0%	
–12.0V	0.5A	1.5A	1.0A	120mV	±3.0%	
+5.1V	8.0A	20A	10A	50mV	±2.0%	NFS110-7604P
+15.0V	4.0A	7.5A	5A	150mV	±3.0%	
–15.0V	0.5A	1.5A	1.0A	150mV	±3.0%	
–5.0V	0.5A	1.5A	1.0A	50mV	±3.0%	
5.1V	16.0A	22.0A	20.0A	50mV	±2.0%	NFS110-7605 (7,8)
12V	7.0A	9.0A	9.0A	120mV	±2.0%	NFS110-7612 (7,8)
15V	5.0A	7.3A	7.3A	150mV	±2.0%	NFS110-7615 (7,8)
24V	3.5A	4.5A	4.5A	240mV	±2.0%	NFS110-7624 (7,8)

Notes

1. Convection cooled, 80W maximum.
2. Peak outputs lasting less than 60 seconds with duty cycle less than 10%. Total peak power must not exceed 110W.
3. Forced air, 20CFM at 1 atmosphere, 110W maximum.
4. Figure is peak-to-peak. Output ripple is measured across a 50MHz bandwidth using a 12 inch twisted pair terminated with a 47µF capacitor.
5. Total regulation is defined as the static output regulation at 25°C, including initial tolerance, line voltage within stated limits and output voltages adjusted to their factory settings.
6. To achieve stated regulation on the 24V output on the NFS110-7602P, the following load condition must be true: I_A / $I_B \leq 5$, where:
   I_A = +5.1V output current, and
   I_B = +24V output current
   The +24V output will maintain ±5.0% regulation under the following additional condition: $I_A \leq 5A$.
7. Single output models have floating outputs which may be referenced as either positive or negative. Higher voltage supplies may be adjusted over a wide output voltage range, as long as the total output power does not exceed 80 Watts (natural convection) or 110 Watts (forced air).
8. Power fail detect not available on single output models.
9. Derating curve is application specific for ambient temperatures >50°C, for optimum reliability no part of the heatsink should exceed 90°C and no semiconductor case temperature should exceed 100°C.
10. Caution: Allow a minimum of 1 second after disconnecting the power when making thermal measurements.
11. Three orthogonal axes, random vibration, 10 minute test for each axis.
12. This product is only for inclusion by professional installers within other equipment and must not be operated as a stand alone product.
13. Artesyn Technologies recommends a minimum load of 11W to achieve the design MTBF. See the derating curve on page 3.

TRANSIENT RESPONSE		
NFS110-7601P	+5.1V (7.5A to 10A)	150mV peak, 1ms recovery
	+12V (2.5A to 5A)	100mV peak, 0.5ms recovery
	-12V (0.5A to 1A)	100mV peak, 0.5ms recovery
	-5V (0.5A to 1A)	100mV peak, 0.5ms recovery
NFS110-7602P	+5.1V (7.5A to 10A)	150mV peak, 1ms recovery
	+24V (1.5A to 3A)	300mV peak, 1ms recovery
	+12V (2.5A to 5A)	100mV peak, 0.5ms recovery
	-12V (0.5A to 1A)	100mV peak, 0.5ms recovery
NFS110-7604P	+5.1V (7.5A to 10A)	150mV peak, 1ms recovery
	+15V (2.5A to 5A)	100mV peak, 0.5ms recovery
	-15V (0.5A to 1A)	100mV peak, 0.5ms recovery
	-5V (0.5A to 1A)	100mV peak, 0.5ms recovery
NFS110-7605	+5.1V (10A to 20A)	250mV peak, 1ms recovery
NFS110-7612	+12V (4.5A to 9A)	360mV peak, 1ms recovery
NFS110-7615	+15V (3.65A to 7.3A)	450mV peak, 1ms recovery
NFS110-7624	+24V (2.25A to 4.5A)	720mV peak, 1ms recovery

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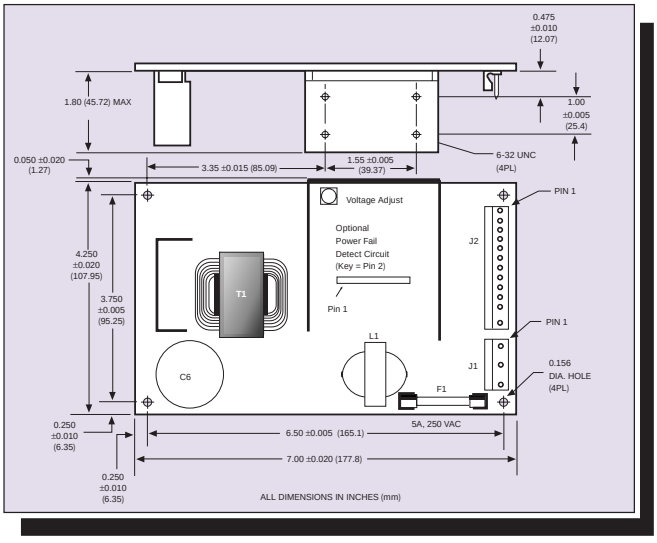
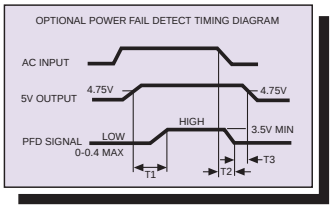
AC (J1) mating connector

Molex 09-50-3051 or Molex 09-91-0500 mating connector with 2478 or equivalent crimp terminals.

DC (J2) mating connector

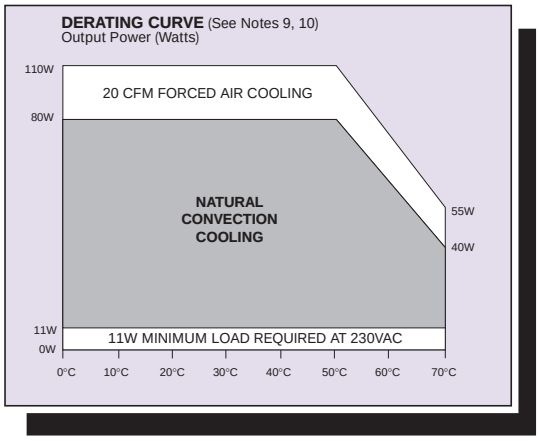
Molex 09-50-3131 or Molex 09-91-1300 mating connector with 2478 or equivalent crimp terminals.





Power fail detect signal (Note 8)

50ms≤T1≤200ms
T2 will vary with line and load
T3≥3ms
Pout: 110W
PFD output is an open collector which will sink ≤40mA in the low state.



Mechanical Notes

- **A** Metallic or non-metallic stand-offs (maximum diameter 5.4mm) can be used in all four mounting holes without effecting safety approval.
- **B** The ground pad of the mounting hole near J1, allows system grounding through a metal stand-off to the system chassis.
- **C** The heat sink is grounded, and allows system grounding by mechanical connection to the system chassis.
- **D** The supply must be mechanically supported using the PCB mounting holes and may be additionally supported by the heatsink mounting holes.
- **E** It is always advisable to attach the power supply heat sink to another thermal dissipator (such as a chassis or finned heatsink etc). The resulting decrease in heat sink mounted component temperatures will improve power supply lifetime.
- **F** A standard L-bracket and cover is available for mounting which contains all screws, connectors and necessary mounting hardware. Two different kits are available, order part number 'NFS110 COVER KIT' or 'NFS110C'.

International Safety Standard Approvals

VDE0805/EN60950/IEC950/IEC1010 File No. 10401-3336-1049
Licence No. 2874, 1653 and 1049

UL1950 File No. E136005

CSA C22.2 No. 950 File No. LR41062C

PIN CONNECTIONS				
J1	**–7601P**	**–7602P**	**–7604P**	**SINGLES**
Pin 1	AC Ground	AC Ground	AC Ground	AC Ground
Pin 2	AC Neutral	AC Neutral	AC Neutral	AC Neutral
Pin 3	AC Line	AC Line	AC Line	AC Line
J2				
Pin 1	+5.1V	+5.1V	+5.1V	V_{out}
Pin 2	+5.1V	+5.1V	+5.1V	V_{out}
Pin 3	+5.1V	+5.1V	+5.1V	V_{out}
Pin 4	Return	Return	Return	Return
Pin 5	Return	Return	Return	Return
Pin 6	Return	Return	Return	Return
Pin 7	Return	Return	Return	Return
Pin 8	+12V	+12V	+15V	V_{out}
Pin 9	+12V	+12V	+15V	V_{out}
Pin 10	PFD	PFD	PFD	N/C
Pin 11	–12V	–12V	–15V	N/C
Pin 12	Removed for Key			
Pin 13	–5V	+24V	–5V	N/C

N/C = no connection.

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